

AMENDMENTS TO THE CLAIMS

1. (currently amended) A multimode dielectric resonator device comprising a dielectric core disposed in a cavity, said dielectric core producing a first TM_{01δ} mode or TM₀₁₁ mode having an electric field directed in a first direction, a second TM_{01δ} or TM₀₁₁ mode having an electric field directed in a second direction perpendicular to the first direction, a first TE_{01δ} mode having an electric field rotated in a plane perpendicular to the first direction, and a second TE_{01δ} mode having an electric field rotated in a plane perpendicular to the second direction, respectively,

wherein ~~effective dielectric constants of individual dielectric core portions having electric flux of an even-mode and an odd-mode of TE coupling mode in the first and the second TE_{01δ} modes passing therethrough are have different effective dielectric constants with each other, and effective dielectric constants of individual dielectric core portions having electric flux of an even-mode and an odd-mode of TM coupling mode in the first and the second TM_{01δ} or TM₀₁₁ mode passing therethrough are have substantially equal effective dielectric constants.~~

2. (currently amended) The multimode dielectric resonator device according to claim 1, wherein ~~the device has at least one protrusion or subsidence and the amount of protrusion or the amount of subsidence of the dielectric core portions having electric flux passing therethrough has a difference between an in even mode and an odd modes of the TE coupling mode are different, and a subsidence or protrusion for canceling frequency changes between the even mode and the odd mode of the TM coupling mode by the difference of the amount of the protrusion or the amount of the subsidence is disposed on the dielectric core portion having a relatively small electric flux~~

density of the TE coupling mode in an amount to canceling frequency changes between the even mode and the odd mode of the TM coupling mode.

3. (currently amended) A multimode dielectric resonator device including comprising a four-stage resonators having the a first TM_{01δ} mode or TM₀₁₁ mode, the a first TE_{01δ} mode, the a second TE_{01δ} mode, the and a second TM_{01δ} mode or TM₀₁₁ mode coupled in sequence, wherein by coupling the first and the second TE_{01δ} modes are coupled with the first and the second TM_{01δ} mode or TM₀₁₁ mode, respectively, by displacing a center of electric field distribution of the first and the second TM_{01δ} modes or the first and the second TM₀₁₁ modes upwardly or downwardly in planes perpendicular to the directions of the electric fields of the first and the second TM_{01δ} modes or the first and the second TM₀₁₁ modes.

4. (currently amended) A dielectric filter comprising: a multimode dielectric resonator device according to claim 3; and an external coupler coupling means for externally coupling the first-stage and the last-stage resonators, respectively, out of the four-stage resonators constituting the multimode dielectric resonator device.

5. (currently amended) A composite dielectric filter comprising two pairs of the dielectric filters according to claim 3, wherein having a shared external coupler coupling means of each one of individual dielectric filters are shared.

6. (currently amended) A communication apparatus comprising the dielectric filter according to claim 4, or the composite dielectric filter according to claim 5 in a high-frequency circuit portion.

7. (new) A communication apparatus comprising the dielectric filter according to claim 4 in a high-frequency circuit portion.

8. (new) A multimode dielectric resonator according to claim 1 wherein the cavity has walls and the dielectric core is spaced from said walls.

9. (new) A multimode dielectric resonator according to claim 1 wherein the dielectric core contacts at least one of said walls.

10. (new) A multimode dielectric resonator according to claim 1 wherein the dielectric core has three layers disposed in an axial direction and the amount or direction or both of the protrusion(s) or subsidence(s) in two of the layers is different.

11. (new) A multimode dielectric resonator according to claim 1 wherein the amount or direction or both of the protrusion(s) or subsidence(s) in the middle layer is different from that in an outermost layer and that of the two outermost layer are the same.

12. (new) A dielectric filter comprising: a multimode dielectric resonator device according to claim 11; and an external coupler externally coupling the first-stage and the last-stage resonators, respectively, of the four-stage resonators constituting the multimode dielectric resonator device.

13. (new) A composite dielectric filter comprising two dielectric filters according to claim 11 having a shared external coupler.

14. (new) A communication apparatus comprising the composite dielectric filter according to claim 13 in a high-frequency circuit portion.

15. (new) A communication apparatus comprising the dielectric filter according to claim 13 in a high-frequency circuit portion.

16. (new) A multimode dielectric resonator according to claim 1 wherein the dielectric core has a cubic shape.

17. (new) A multimode dielectric resonator according to claim 1 wherein the dielectric core has a substantially cylindrical shape.

18. (new) A multimode dielectric resonator according to claim 1 wherein the dielectric core has a cross shape.